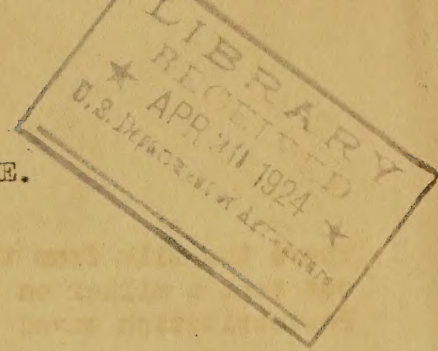


Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

UNITED STATES DEPARTMENT OF AGRICULTURE.
Dairy Exhibit, 1923:

VALUE OF PASTEURIZATION.



What is pasteurization? How does it affect milk. An exhibit of the U. S. Department of Agriculture entitled "Value of Pasteurization" tells you about the process of pasteurization, how it safeguards milk, and how the pasteurization of milk has increased in this country.

Pasteurization is not an arbitrary term, but is the name given to a process of heating liquids. The name was given in honor of the work of Pasteur in 1864. As applied to milk, the primary object of pasteurization is the destruction of any disease germs which may be present. Three processes of pasteurization have been used in this country; the flash process, the holder or holding process, and pasteurization in the bottle. In the flash process milk is heated in from 30 seconds to 1 minute to a temperature of at least 160° F. It is then immediately cooled and bottled. This process is not used extensively in this country for the pasteurization of milk. The holder process consists of heating milk to 145° F. in tanks and holding it for 30 minutes, after which it is cooled and bottled. This is the process most extensively used in this country. Sometimes milk is bottled first and then heated to 145° F., held for 30 minutes, and then cooled in the bottle. This process, known as in-the-bottle pasteurization, has many points to commend it.

Pasteurization gives protection without injury to the milk, as is shown by the following facts.

It has practically no effect on the chemical composition of milk. In milk pasteurized at 145° F. for 30 minutes the albumen and globulin are not precipitated, and neither is there change in the soluble salts.

Milk pasteurized at 145° F. for 30 minutes sours normally, and does not decompose, as many believe it does. The proportion of acid-forming bacteria to the total number of bacteria is actually increased when milk is pasteurized in this way, and the milk sours as normally as raw milk of equivalent bacterial quality. This is not true of high-temperature pasteurization.

Pasteurization has no effect on the vitamins fat-soluble A and water-soluble B. Water-soluble C is weakened or destroyed; but in the case of infant feeding this deficiency can be easily made up by the addition of orange or tomato juice. In the case of adults water-soluble C is amply supplied by green vegetables.

A very striking evidence of the value of pasteurization is shown in the center panel of the exhibit. This is an accidental human experiment which showed the usefulness of pasteurization as a safeguard against typhoid fever. The milk from one farm went to two cities. In one of these cities the milk was sold raw and in the other it was pasteurized. In the city which had the raw milk 12 cases of typhoid fever developed which were traced to the milk from that farm, but no cases developed in the other city

where the milk from the same farm was pasteurized. Investigation brought out that a milker on the farm had typhoid fever and infected the milk. Pasteurization saved one city from an epidemic.

Such evidence as this, of the value of pasteurization, accounts for the remarkable increase in its use, as shown by charts in the third panel of this exhibit. As an illustration take New York City. In 1903 about 5 per cent of the milk supply of New York was pasteurized; in 1912, about 40 per cent; in 1914, about 88 per cent; and 1921, 98 per cent. The extent of pasteurization is equally striking in the smaller cities. Figures in 1921 from 88 cities of less than 10,000 population showed that in 22 of them 50 per cent of the milk was pasteurized; in 12 others, from 11 to 50 per cent of the milk. Some cities require the pasteurization of all milk except certified or equivalent grades. Experience with pasteurization may be summed up as follows:

1. No epidemics have been traced to properly pasteurized milk.
2. Proper pasteurization destroys the pathogenic organisms sometimes found in milk.
3. After pasteurization, milk is handled by so few people before it reaches the consumer that it can be protected against further infection by frequent medical inspection of the small number of people concerned.
4. Tuberculin testing properly used is a safeguard against bovine tuberculosis, but does not protect against typhoid fever, diphtheria, septic sore throat, and other milk-borne diseases. This emphasizes the need for pasteurization.
5. Pasteurized milk sours like new milk of equivalent bacterial quality.
6. The only change in milk caused by pasteurization is the reduction of vitamin C. This deficiency is easily supplied by feeding tomato or orange juice.
7. Pasteurization is increasing each year.

For further information send for U. S. Department of Agriculture Bulletin 342, The Present Status of the Pasteurization of Milk.